Chihuahuan Desert Network Vegetation Mapping Projects

Progress Report [1]

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This is a report of the progress made on four vegetation mapping projects being conducted by Natural Heritage New Mexico (NHNM) in cooperation with the Chihuahuan Desert Network (CHDN) of the National Park Service between January 2006 through April, 2007. The projects are in various stages of completion depending on the park, and date of project initiation. Accordingly, a task table is provided for each project which specifies specific tasks and their anticipated completion dates.

Carlsbad Caverns National Park (CAVE)

The accuracy assessment (AA) of the 2003 Carlsbad Caverns National Park vegetation map was initiated at the beginning of 2006. Using the vegetation map in a GIS, a suite of AA plots were randomly selected for field sampling constrained by the number of polygons per map unit, and the logistics of reaching sites within the timeframe allotted. All polygons had not been previously visited nor were any of the AA team member involved in plot selection. Over the course of a six-week field campaign, 342 AA plots were collected across the park and in all major vegetation map units with the exception of the remote wilderness ponderosa pine and pinyon-juniper woodlands (the latter are very conspicuous in the imagery, but exceedingly difficult to reach and hence excluded) along with isolated and rare wetlands. These data points have been inputted into the NHNM ecology database and quality controlled. All voucher specimens have been identified and deposited at the UNM herbarium. Currently, an AA analysis is being conducted, and a report will be produced by the fall of 2007 for park and network review.

Carlsbad Caverns National Park Vegetation Map Accuracy Assessment Project

CAVE Scheduled Tasks

Task #	Task	Comments
1	Project scoping	Completed
2	Accuracy Assessment (AA) work plan	Completed

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3	GIS setup	Completed
4	AA plot/polygon assignment	Completed
5	Accuracy assessment field campaign (6 weeks)	Completed
6	Plot data entry	Completed with QC
7	Plant voucher ID	Completed
8	Progress report 1	In progress
10	Plot classification	Spring 2007
11	AA analysis	Summer 2007
12	Draft Final Report	Fall 2007
13	AA report review	Fall 2007
14	Final AA report	Winter 2007
15	Park/Network final product delivery meeting	Winter 2007

Fort Davis National Historic Park (FODA)

This vegetation mapping project was initiated at the beginning of 2006 with the task to produce a base map based on one-meter resolution satellite imagery. A winter-scene QuickBird satellite imagery was acquired over the park on February 16, 2006. A base map using this scene will be produced in preparation for the on-site meeting to be held in June of 2007 to plan the rest of the vegetation mapping project. An initial field sampling period is planned for the fall of 2007 to support the development of a vegetation classification and a map unit legend. An additional summer/fall QuickBird image will also be acquired in the fall and will be used in conjunction with the winter image and other ancillary layers to build the vegetation map as specified under subsequent tasks to be outlined for the project.

Fort Davis National Historic Site Vegetation Map

FODA Scheduled Tasks

Task #	Task	Comments
1	Project planning	In progress
2	Acquire satellite imagery	Winter image acquired
3	Image pre-processing	Completed
4	GIS setup	Completed
5	Photo-image map based on satellite imagery	June 2007
6	Progress Report 1	In progress
7	Project scoping meeting/reconnaissance	June 2007
8	Final vegetation map work plan/ budget	Summer 2007
9	Acquire satellite imagery	Fall 2007
10	Initial field campaign (1 week)	Fall 2007
11	Plot data entry	Winter 2007-08
12	Plant voucher ID	Winter 2007-08
13	Progress Report 2	Spring 2007-08
14	To be determined	

Guadalupe Mountains National Park (GUMO)

The Guadalupe Mountains National Park (GUMO) mapping project was initiated in January, 2006. In preparation for the first sampling season, an on-site meeting was conducted with park staff in the spring of 2006 to outline the project scope and duration, and to finalize the logistical details for the sampling campaign. In late summer of 2006, we conducted a six-week field sampling campaign with a three-member team that included an eight-day wilderness expedition into the high country, and two lowland sessions that covered the eastern and western desert portions of the park. A total of 98 plots were collected of which 40 were from the wilderness. A total of 3269 floristic records for 454 species (taxonomic units) were entered into the NHNM plot database. Species identifications were supported by 440 collected vouchers. Voucher collection identifications were made by Yvonne Chauvin, and the specimens deposited with the Museum of Southwestern Biology at the University of New Mexico (UNM) under the name of each project. In addition, fuels data was collected on each plot for later use in fire modeling and planning.

For the mapping, we acquired digital ortho-color infrared aerial imagery at 1:12,000 scale from the Texas Department of Natural Resources (the original intent to acquire multi-spectral/pan satellite imagery from DigitalGlobe was abandoned because the scope of the project was beyond the capacity of the company). A GIS was constructed to hold the images and ancillary layers, and ultimately the vegetation map itself. A preliminary unassigned polygon vegetation map was developed using eCognition software, and was used to guide 2006 summer sampling (i.e., potential plot locations for sampling were first determined in the GIS using the polygon map and aerial photo interpretation.) Field crews then used a GPS to guide them to sample point locations.

Currently, the plot data has been entered, and is being quality controlled through a read-back procedure. The voucher identifications are nearly complete and the names corrected in the database. Upon completion of the data entry process, a preliminary vegetation classification and associated map unit legend will be developed. The plots will then be used in a supervised vegetation classification to assign initial map unit designations to the polygons.

The next step is to conduct a second, more intensive sampling campaign that will focus on both improvements to the vegetation classification and increasing ground control for the mapping process. This will include a 12-week field campaign involving two teams. One to collect relevé-style plots to support the classification and fuels modeling, and another to collect quick plots to provide additional ground control over a wider area for mapping.

Guadalupe Mountains National Park Vegetation Map Project

GUMO Scheduled Tasks

Task #	Task	Comments
1	Project scoping	Completed
2	Final work plan	Completed
3	Acquire satellite imagery	Completed

4	Image pre-processing	Completed
5	Acquire available plot data	Completed
6	Analysis layer development	Completed
7	GIS setup	Completed
8	YR1 field campaign	Extended from 2 to 6 weeks--Completed
9	Plot data entry	Complete with QC
10	Plant voucher ID	In progress
11	Progress report 1	In progress
12	Provisional vegetation classification/map Legend	Summer 2007
13	Provisional map	In progress: eCcognition primitives created but unclassified
14	Main classification/fuels/ground control field campaign YR2 (12 weeks)	Summer 2007
15	Plant voucher ID/data entry	Winter 07-08
16	Draft vegetation classification and key	Spring 08
17	Revised supervised image classification	Summer 08
18	Supplemental field sampling as needed	Summer 08 2-4 weeks
19	Plant voucher ID/data entry	Fall 08
21	1:24,000 interpreted revision/remote sensing Integration	Fall 08 -- Winter 08-09
22	Progress report 2	Spring 09
23	Park/Network/NHNM meeting on map legend content	Spring 09
24	Draft final vegetation classification, keys and Descriptions report	Spring/summer 09
25	Draft final map and unit descriptions report	Spring/summer 09
26	Map and classification report review	Fall 2009
27	Final classification/map report	Winter 2009-2010
28	Accuracy assessment field campaign (12 weeks)	Sumer 09
29	AA plot data entry	Fall/Winter 09-2010
30	AA analysis and draft report	Spring 2010
31	Final AA report review	Summer 2010
32	Final AA report	Fall 2010
33	Park/Network final product delivery meeting	Fall 2010

White Sands National Monument (WHSA)

This project was originally proposed as an accuracy assessment project for a vegetation map produced in the early 1990's for the park. Based on the current protocols of the vegetation mapping program and the need for an up-to-date map, the tasks for this project have been modified. The current plan is to acquire new imagery in the fall of 2007 (QuickBird or Iconos), conduct an onsite scoping meeting at the park to discuss the project goals and begin planning for the first year's sampling of vegetation. The first field campaign will be conducted in the summer of 2007. Subsequent classification and mapping tasks to be detailed later.

White Sands National Monument Vegetation Map

WHSA Scheduled Tasks

Task #	Task	Comment
1	Progress Report 1	In progress
2	GIS setup	Completed
3	Project scoping meeting/reconnaissance	Summer 2007
4	Draft workplan/budget	Summer 2007
5	YR1 field campaign	Summer 2007
6	Acquire satellite imagery	Summer/Fall 2007
7	Image pre-processing	Fall 2007
8	Plot data entry	Fall/Winter 2007-08
9	Plant voucher ID	Fall/Winter 2007-08
10	Provisional vegetation classification/map legend	Spring 2008
11	Progress Report 2	Spring 2008
12	To be determined	